

MULTIMEDIA



UNIVERSITY

STUDENT ID NO

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MULTIMEDIA UNIVERSITY

FINAL EXAMINATION

TRIMESTER 2, 2018/2019

DCS5038 – PROGRAM DESIGN

(DIT Groups)

7 MARCH 2019
2.30 p.m. – 4.30 p.m.
(2 Hours)

INSTRUCTIONS TO STUDENT:

1. This question paper consists of 8 pages with 5 questions.
2. **SECTION A:** Answer **ALL** questions.
3. **SECTION B:** Answer **ONLY ONE (1)** question.
4. Please write all your answers in the Answer Booklet provided.

SECTION A (30 Marks)

Instruction: Answer *ALL* questions from this section and write your answers in the answer booklet provided.

QUESTION 1 (10 Marks)

- a. Based on the descriptions given below, draw the **flowchart** to calculate grand total for Afaqosa Theme Park entrance fee. [5 marks]

- Initialize all the required variables.
- Get the input *quantity* from the user.
- Get the input type of *entrance* from the user.
- Using *if-else* statement, set the *ticket price* based on the type of *entrance*.

Type of Entrance	Ticket Price (RM)
1	32.00
2	45.00
3	38.00

- Calculate *total payment* based on the formula given.
total payment = quantity x ticket price
- Calculate *grand total* based on the formula given.
grand total = grand total + total payment
- Display the *total payment*.
- Repeat the process by asking the user whether to continue or to terminate the program. Use a *do while* loop.
- Display the *grand total*.

SAMPLE OUTPUT

```

Enter guest quantity : 3
1. Water Park
2. Cowboy Town
3. Mini Zoo
Enter type of entrance:1
Total payment 96.00
Do you want to continue :Y
Enter guest quantity : 2
1. Water Park
2. Cowboy Town
3. Mini Zoo
Enter type of entrance:2
Total payment 90.00
Do you want to continue :Y
Enter guest quantity : 4
1. Water Park
2. Cowboy Town
3. Mini Zoo
Enter type of entrance:3
Total payment 152.00
Do you want to continue :N
Grand total : 338.00

```

- b. Based on the descriptions given in (a), write the **pseudocode**. [5 marks]

Continued...

QUESTION 2 (10 Marks)

- a. Convert the following mathematical formulas to the proper C expressions. Use appropriate built-in functions from the *math.h* header file. [2 marks]

i. $M = (MN)^2\sqrt{X}$

ii. $K = \frac{\sqrt{X+A}}{\sqrt{X^3}}$

- b. Write the *switch case* statement that determines the movie *name* and *price* of movie depending on the *code* chosen by user as indicated in the Table 1. [4 marks]

Movie Online		
Code	Movie Name	Ticket Price (RM)
A	Game Night	8.80
B or 2	Immaikka Nodigal	7.50
C or 3	The Great Wall	8.00
Others	Invalid	0.00

Table 1: Ticket Price

- c. Complete the program based on the instructions given below. The program will get input from the user for 4 times and to display the total payment after calculate the sale tax. You need to complete the code for the parts that are labeled (i) until (iv). [4 marks]
- Get the *amount* from the user.
 - Call function *calculate_SST(...)* and pass the array *amount* as the parameter to get the value of *total*.
 - Write a function header for *calculate_SST(...)*.
 - Calculate the *total* of *amount*.

Continued...

```

#include<stdio.h>
float calculate_SST(float[]);
float sale_tax = 0.06;
float total=0;
int main()
{
    int i; float amount[4];
    for(i=0;i<4;i++)
    {
        printf("Enter price for the %d item: ",i+1);
        ..... (i) .....
    }

    ..... (ii) .....

    printf("Total : %.2f\n",total);
}

..... (iii) .....
{
    int i;
    for(i=0;i<4;i++)
    {
        ..... (iv) .....
    }
    total = total - (total * sale_tax);
    return total;
}

```

QUESTION 3 (10 Marks)

- a. The program is to calculate a total payment after booking hotel rooms. Write **C** code based on the following instructions. [5 marks]
 - i. Declare a structure of Hotel ABC record called *booking* that has the following members:
 - o Day : *day(integer)*
 - o Quantity : *quantity(integer)*
 - o Total : *total(float)*
 - ii. Create a structure variable called *hotel*.
 - iii. Declare a variable for price and assign 150.00 to it.
 - iv. Prompt user to enter *day* and *quantity*.
 - v. Calculate the total payment based on the following formula:

$$\text{total} = \text{price} \times \text{day} \times \text{quantity}$$
 - vi. Display *day*, *quantity* and *total*.

SAMPLE OUTPUT

```

Enter day to stay and room quantity: 3 4
Day: 3
Quantity :4
Total payment :1800.00

```

Continued...

- b. The program is to calculate the summon fee for the persons in the file. Write **C code** based on the following instructions. [5 marks]
- Create file variables named *input* and *output*.
 - Open the file *summon_list.txt* for reading using *input* and *output* for append the file.
 - Use a *while loop* statement to loop till the end of the file:
 - Read all the data from the file and store them in appropriate variables.
 - Based on the Table 2, determine the *summon fee* using *if else* statement.

Speed	Summon Fee
More than equal 100	300
Others	150

Table 2: Summon Fee

- Write the *name*, *speed*, *summon fee* in the output file.
- iv. Close the files.
The contents of the files are shown below.

Content of *summon_list.txt* before execution

```
<Name> <speed>
Jason      95
Rameshan  120
Zafran     100
```

Content of *summon_list.txt* after execution

```
<Name> <speed> <summonfee>
Jason      95
Rameshan  120
Zafran     100

Jason 95 150.00
Rameshan 120 300.00
Zafran 100 300.00
```

Continued...

SECTION B (20 Marks)

Instruction: Choose and answer **ONLY ONE (1)** question from this section and write your answers in the answer booklet provided.

QUESTION 1 (20 Marks)

Write a complete program based on the following instructions. This program prompts the user to enter the code for training registration. At the end of this program, it will calculate the total payment and the grand total after discount.

Declare a *structure* called *Training* that has the following members:

- Participant Name : *name (string)*
- Training Code : *code (string)*
- Fee : *fee (float)*

In function *main()* :

- Ask the user to enter the *number* of participants.
- Create a structure variable array named *T* which the size depends on the *number* of participant that the user has keyed-in earlier.
- Using a *while loop* :
 - Prompt the user to enter *name*.
 - Call function *display()*.
 - Prompt the user to enter training *code*.
 - Call function *set_fee(...)* and pass *code* as the parameter to determine the *fee* per code.
 - Display the *fee* of the training.
 - Calculate total *payment* after sum up the total *fee*.
 - Display the *payment*.
- Call function *calc_discount(...)* and pass *payment* and *number* as pointer parameters to determine the *grand total*.
- Display *grand total*.

In function *display()*:

- Declare a prototype for this function.
- Display the menu information based on the sample output given.

In function *set_fee(...)*:

- Declare a prototype for this function.
- Determine the *fee* based on the code in the table given:

Code	Fee (RM)
C101	165.00
C102	125.00
Others	0.00

- Return the *fee*.

Continued...

In function *calc_discount(...)*:

- Declare a prototype for this function.
- Determine the *discount* based on number of participants in the table below:

Number of participant	Discount
More than 2	0.2
Others	0

- Calculate the *grand total* based on the following formula:
Grand total= payment - (discount x payment)
- Return the *grand total*.

SAMPLE OUTPUT

Enter the number of participants : 3

Enter your name : **Celin**

Training Code

C101 Augmented Reality

C102 Mobile Development

Enter training code : C101

Fee: RM 165.00

Payment: RM 165.00

Enter your name : **Rose Lin**

Training Code

C101 Augmented Reality

C102 Mobile Development

Enter training code : C102

Fee: RM 125.00

Payment: RM 290.00

Enter your name : **Kemala Sari**

Training Code

C101 Augmented Reality

C102 Mobile Development

Enter training code : C101

Fee: RM 165.00

Payment: RM 455.00

Grand Total : RM 364.00

Continued...

QUESTION 2 (20 Marks)

Write a complete program that determines the student payment after the discount.

Given is a text file named *student_list.txt* that contains data of *student id*, *CGPA*, and *balance*.

Content of <i>student_list.txt</i>				
<student_id> <CGPA> <balance>				
1001800891	3.85	3580.00		
1001800275	2.76	4750.00		
1001800122	1.95	2790.00		
1001800145	3.20	5600.00		

Another text file named *student_payment.txt* is an empty file.

In function *main()* :

- Declare all necessary variables.
- Create file variables name: *read* and *write*.
- Open the file *student_list.txt* for reading.
- Open the file *student_payment.txt* for writing.
- If the file *student_list.txt* doesn't exist, display "*File cannot be accessed!*", else use a *while* loop to read each record until the end of the file:
 - Read the *student id*, *CGPA*, and *balance* from the file.

[Hint: Use array for the variables]

- Using *for* loop statement,
 - Display *student id*, *CGPA*, and *balance* to the command prompt.
 - Determine *discount* based on the following table:

CGPA	Discount
More and equal to 3.67	0.4
More and equal to 3.00	0.3
More and equal to 2.75	0.1
Others	0

- Call function *calculate(...)* and pass *balance* and *discount* as the parameters.
- Using another *for* loop statement:
 - Write the *student id*, *CGPA*, *balance*, *discount* and *payment* into file *student_payment.txt* as shown below.

Content of <i>student_payment.txt</i> after execution				
<student_id> <CGPA> <balance> <discount> <payment>				
1001800891	3.85	3580.00	0.40	2148.00
1001800275	2.76	4750.00	0.10	4275.00
1001800122	1.95	2790.00	0.00	2790.00
1001800145	3.20	5600.00	0.30	3920.00

- Display all data in the command prompt as shown in the sample output.

Continued...

SAMPLE OUTPUT				
ID	CGPA	Fee Balance		
1001800891	3.85	3580.00		
1001800275	2.76	4750.00		
1001800122	1.95	2790.00		
1001800145	3.20	5600.00		
ID	CGPA	Fee Balance	Discount	Payment
1001800891	3.85	3580.00	0.40	2148.00
1001800275	2.76	4750.00	0.10	4275.00
1001800122	1.95	2790.00	0.00	2790.00
1001800145	3.20	5600.00	0.30	3920.00

- Close the files.

In function *calculate(...)*:

- Declare a prototype for this function.
- Determine the *payment* based on the following formula.
$$\text{payment} = \text{balance} - (\text{discount} \times \text{balance})$$
- Return the *payment* value.

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